Mr. Michael T. Davis WLPCS Calculus	Sections 2.1 & 2.2 Practice Quiz November 7, 2017

Name: Solutions / Answers

Without a calculator, evaluate each limit:

1. $\lim_{x\to 2}\left(x^2+3x-1\right)=$ $(2)^2+3(2)-1=4+6-1=9$

2. $\lim_{x\to 0}\dfrac{\sin x}{x}=$ 1

3. $\lim_{x\to \infty}\dfrac{\sin x}{x}=$ 0

4. $\lim_{t\to 3^+}\dfrac{2}{t-3}=$ ∞

5. $\lim_{k\to 0}\dfrac{|k|}{k}=$ undefined

6. $\lim_{y \to 2} \frac{y^2-3y+2}{y^2-4} =$ $\lim_{y \to 2} \frac{(y-1)(y-2)}{(y-2)(y+2)} = \lim_{y \to 2} \frac{y-1}{y+2} = \frac{1}{4}$

7. $\lim_{t \to \infty} \frac{6t^2+5t}{2t^2+8} =$ $\frac{6}{2} = 3$

8. $\lim_{t \to \infty} \frac{5t-3}{t^2-9} =$ 0

9. $\lim_{t \to \infty} \frac{6t^3+5t^2}{2t^2-t} =$ ∞

10. Given $f(t) = \begin{cases} 2t+4 & if\ t \le -1 \\ -3t-2 & if\ t > -1 \end{cases}$, $\lim_{t \to -1^+} f(t) =$ 1

11. Given $f(t)=\begin{cases}2t+4 \text{ if } t\leq -1\\ -3t-2 \text{ if } t>-1\end{cases}$, $\lim_{t\to -1} f(t)=$ undefined since

$\lim_{t\to -1^-} f(t) \neq \lim_{t\to -1^+} f(t)$

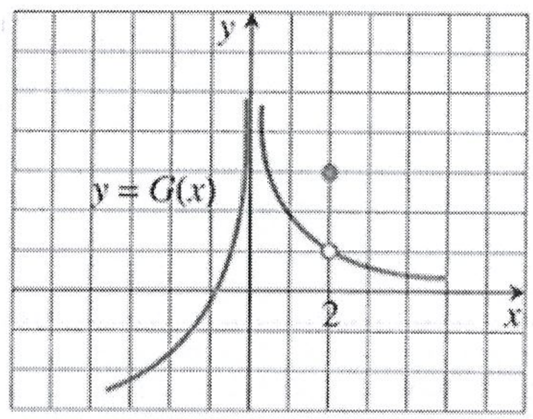
$2 \neq 1$

12. Given $g(x)=\begin{cases}5-x \text{ if } x<2\\ \frac{1}{2}x+2 \text{ if } x\geq 2\end{cases}$, $\lim_{x\to 2} g(x)=$ 3 since $\lim_{x\to 2^+} g(x)=3$ and

$\lim_{x\to 2^-} g(x)=3$

13. Given the graph of $y=G(x)$, determine each of the following:

a. $G(2)=$ 3



b. $\lim_{x\to 2} G(x)=$ 1

14. Evaluate $\lim_{x\to\infty}\frac{5x+\sin x}{x}=$ $\lim_{x\to\infty}\left(\frac{5x}{x}+\frac{\sin x}{x}\right) = \lim_{x\to\infty}(5) + \lim_{x\to\infty}\frac{\sin x}{x}$

$= 5 + 0$

$= 5$

15. Evaluate $\lim_{x \to 0} \frac{5x+\sin x}{x} =$ $\lim_{x \to 0} \left(\frac{5x}{x} + \frac{\sin x}{x}\right) = \lim_{x \to 0} (5) + \lim_{x \to 0} \frac{\sin x}{x}$

$= 5 + 1$

$= 6$

16. Give the equations of the two vertical asymptotes closest to the origin on the graph of $f(x) = \tan x$

$x = -\frac{\pi}{2}$ and $x = \frac{\pi}{2}$

17. Find a simple right end behavior model for the function $f(x) = e^x - 2x$

$g(x) = e^x$

18. Evaluate $\lim_{k \to -\infty} \frac{1-\cos x}{x^2} =$ 0

19. Evaluate $\lim_{x \to \infty} \left(\frac{2}{x}+1\right)\left(\frac{5+x^2}{x^2}\right) =$ $\lim_{x \to \infty} \left(\frac{2}{x}+1\right) \cdot \lim_{x \to \infty} \left(\frac{5}{x^2}+1\right)$

$= (1) \cdot (1)$

$= 1$

20. Write a power function end behavior model for the function $f(x)=3x^2+2x-1$

$g(x) = 3x^2$

21. Write a power function end behavior model for the function $f(x)=\dfrac{x^5-x^4+x+1}{2x^2+x-3}$

$g(x) = \frac{1}{2}x^3$

22. Write a power function end behavior model for the function $f(x)=\dfrac{x-2}{2x^2+3x-5}$

$g(x) = \frac{1}{2x}$

23. Evaluate $\lim\limits_{x\to\infty}\left(x^2e^{-x}\right)=$ $\lim\limits_{x\to\infty}\left(\frac{x^2}{e^x}\right) = 0$

24. Evaluate $\lim\limits_{x\to-\infty}\left(x^2e^{-x}\right)=$ ∞

25. Evaluate $\lim_{x\to 3}\frac{x-3}{x^3-27}=$ $\lim_{x\to 3}\frac{x-3}{(x-3)(x^2+3x+9)}=\lim_{x\to 3}\frac{1}{x^2+3x+9}$

$$=\frac{1}{(3)^2+3(3)+9}$$

$$=\frac{1}{27}$$

26. Sketch a graph of a function $y=f(x)$ that satisfies the stated conditions. Include any asymptotes.

Conditions: $\lim_{x\to 1}f(x)=2$, $\lim_{x\to 5^-}f(x)=\infty$, $\lim_{x\to 5^+}f(x)=\infty$, $\lim_{x\to\infty}f(x)=-1$, $\lim_{x\to -2^+}f(x)=-\infty$, $\lim_{x\to -2^-}f(x)=\infty$, & $\lim_{x\to -\infty}f(x)=0$